



15

<110> Bristol-Myers Squibb Company
Chiang, Shu-Jen
Jonathan, Basch

<120> DIRECT PRODUCTION OF DESACETYLCEPHALOSPORIN C

<130> ON0163

<140> 09/801,852
<141> 2001-03-08

<150> 60/188,033
<151> 2000-03-09

<160> 15

<170> PatentIn version 3.0

<210> 1
<211> 1716
<212> DNA
<213> Rhodosporidium toruloides

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<212> PRT
<213> Rhodosporidium toruloides

<400> 2

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Glu Pro Pro Pro Val Val Asp Leu Gly Tyr Ala Arg Tyr Gln Gly Tyr
35 40 45

Leu Asn Glu Thr Ala Gly Leu Tyr Trp Trp Arg Gly Ile Arg Tyr Ala
50 55 60

Ser Ala Gln Arg Phe Gln Ala Pro Gln Thr Pro Ala Thr His Lys Ala
65 70 75 80

Val Arg Asn Ala Thr Glu Tyr Gly Pro Ile Cys Trp Pro Ala Ser Glu
85 90 95

Gly Thr Asn Thr Thr Lys Gly Leu Pro Pro Pro Ser Asn Ser Ser Ser
100 105 110

Ser Ala Pro Gln Lys Gln Ala Ser Glu Asp Cys Leu Phe Leu Asn Val
115 120 125

Val Ala Pro Ala Gly Ser Cys Glu Gly Asp Asn Leu Pro Val Leu Val
130 135 140

Tyr Ile His Gly Gly Tyr Ala Phe Gly Asp Ala Ser Thr Gly Ser
145 150 155 160

Asp Phe Ala Ala Phe Thr Lys His Thr Gly Thr Lys Met Val Val Val
165 170 175

Asn Leu Gln Tyr Arg Leu Gly Ser Phe Gly Phe Leu Ala Gly Gln Ala
180 185 190

Met Lys Asp Tyr Gly Val Thr Asn Ala Gly Leu Leu Asp Gln Gln Phe
195 200 205

Ala Leu Gln Trp Val Gln Gln His Val Ser Lys Phe Gly Gly Asn Pro
210 215 220

Asp His Val Thr Ile Trp Gly Glu Ser Ala Gly Ala Gly Ser Val Met
225 230 235 240

Asn Gln Ile Ile Ala Asn Gly Gly Asn Thr Val Lys Ala Leu Gly Leu
245 250 255

Lys Lys Pro Leu Phe His Ala Ala Ile Gly Ser Ser Val Phe Leu Pro
260 265 270

Tyr Gln Ala Lys Tyr Asn Ser Pro Phe Ala Glu Leu Leu Tyr Ser Gln
275 280 285

Leu Val Ser Ala Thr Asn Cys Thr Lys Ala Ala Ser Ser Phe Ala Cys
290 295 300

Leu Glu Ala Val Asp Ala Ala Ala Leu Ala Ala Ala Gly Val Lys Asn
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Ser Ala Ala Phe Pro Phe Gly Phe Trp Ser Tyr Val Pro Val Val Asp
325 330 335

Gly Thr Phe Leu Thr Glu Arg Ala Ser Leu Leu Ala Lys Gly Lys
340 345 350

Lys Asn Leu Asn Gly Asn Leu Phe Thr Gly Ile Asn Asn Leu Asp Glu
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Gly Phe Ile Phe Thr Asp Ala Thr Ile Gln Asn Asp Thr Ile Ser Asp
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Gln Ser Gln Arg Val Ser Gln Phe Asp Arg Leu Leu Ala Gly Leu Phe
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Pro Tyr Ile Thr Ser Glu Glu Arg Gln Ala Val Ala Lys Gln Tyr Pro
405 410 415

Ile Ser Asp Ala Pro Ser Lys Gly Asn Thr Phe Ser Arg Ile Ser Ala
420 425 430

Val Ile Ala Asp Ser Thr Phe Val Cys Pro Thr Tyr Trp Thr Ala Glu
435 440 445

Ala Phe Gly Ser Ser Ala His Lys Gly Leu Phe Asp Tyr Ala Pro Ala
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His His Ala Thr Asp Asn Ser Tyr Tyr Ile Gly Ser Ile Trp Asn Gly
465 470 475 480

Lys Lys Ser Val Ser Ser Val Gln Ser Phe Asp Gly Ala Leu Gly Gly
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Phe Ile Glu Thr Phe Asn Pro Asn Asn Ala Ala Asn Lys Thr Ile
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Asn Pro Tyr Trp Pro Thr Phe Asp Ser Gly Lys Gln Leu Leu Phe Asn
515 520 525

Thr Thr Thr Arg Asp Thr Leu Ser Pro Ala Asp Pro Arg Ile Val Glu
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Thr Ser Ser Leu Thr Asp Phe Gly Thr Ser Gln Lys Thr Lys Cys Asp
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Phe Trp Arg Gly Ser Ile Ser Val Asn Ala Gly Leu
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<210> 3

<211> 2220

<212> DNA

<213> Rhodosporidium toruloides

<400> 3

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<211> 544
<212> PRT

<213> Rhodosporidium toruloides

<400> 4

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Ile Arg Tyr Ala Ser Ala Gln Arg Phe Gln Ala Pro Gln Thr Pro Ala
35 40 45

Thr His Lys Ala Val Arg Asn Ala Thr Glu Tyr Gly Pro Ile Cys Trp
50 55 60

Pro Ala Ser Glu Gly Thr Asn Thr Thr Lys Gly Leu Pro Pro Pro Ser
65 70 75 80

Asn Ser Ser Ser Ala Pro Gln Lys Gln Ala Ser Glu Asp Cys Leu
85 90 95

Phe Leu Asn Val Val Ala Pro Ala Gly Ser Cys Glu Gly Asp Asn Leu
100 105 110

Pro Val Leu Val Tyr Ile His Gly Gly Tyr Ala Phe Gly Asp Ala
115 120 125

Ser Thr Gly Ser Asp Phe Ala Ala Phe Thr Lys His Thr Gly Thr Lys
130 135 140

Met Val Val Val Asn Leu Gln Tyr Arg Leu Gly Ser Phe Gly Phe Leu
145 150 155 160

Ala Gly Gln Ala Met Lys Asp Tyr Gly Val Thr Asn Ala Gly Leu Leu
165 170 175

Asp Gln Gln Phe Ala Leu Gln Trp Val Gln Gln His Val Ser Lys Phe
180 185 190

Gly Gly Asn Pro Asp His Val Thr Ile Trp Gly Glu Ser Ala Gly Ala
195 200 205

Gly Ser Val Met Asn Gln Ile Ile Ala Asn Gly Gly Asn Thr Val Lys
210 215 220

Ala Leu Gly Leu Lys Lys Pro Leu Phe His Ala Ala Ile Gly Ser Ser
225 230 235 240

Val Phe Leu Pro Tyr Gln Ala Lys Tyr Asn Ser Pro Phe Ala Glu Leu
245 250 255

Leu Tyr Ser Gln Leu Val Ser Ala Thr Asn Cys Thr Lys Ala Ala Ser
260 265 270

Ser Phe Ala Cys Leu Glu Ala Val Asp Ala Ala Ala Leu Ala Ala Ala
275 280 285

Gly Val Lys Asn Ser Ala Ala Phe Pro Phe Gly Phe Trp Ser Tyr Val
290 295 300

Pro Val Val Asp Gly Thr Phe Leu Thr Glu Arg Ala Ser Leu Leu Leu
305 310 315 320

Ala Lys Gly Lys Lys Asn Leu Asn Gly Asn Leu Phe Thr Gly Ile Asn
325 330 335

Asn Leu Asp Glu Gly Phe Ile Phe Thr Asp Ala Thr Ile Gln Asn Asp
340 345 350

Thr Ile Ser Asp Gln Ser Gln Arg Val Ser Gln Phe Asp Arg Leu Leu
355 360 365

Ala Gly Leu Phe Pro Tyr Ile Thr Ser Glu Glu Arg Gln Ala Val Ala
370 375 380

Lys Gln Tyr Pro Ile Ser Asp Ala Pro Ser Lys Gly Asn Thr Phe Ser
385 390 395 400

Arg Ile Ser Ala Val Ile Ala Asp Ser Thr Phe Val Cys Pro Thr Tyr
405 410 415

Trp Thr Ala Glu Ala Phe Gly Ser Ser Ala His Lys Gly Leu Phe Asp
420 425 430

Tyr Ala Pro Ala His His Ala Thr Asp Asn Ser Tyr Tyr Ile Gly Ser
435 440 445

Ile Trp Asn Gly Lys Lys Ser Val Ser Ser Val Gln Ser Phe Asp Gly
450 455 460

Ala Leu Gly Gly Phe Ile Glu Thr Phe Asn Pro Asn Asn Asn Ala Ala
465 470 475 480

Asn Lys Thr Ile Asn Pro Tyr Trp Pro Thr Phe Asp Ser Gly Lys Gln
485 490 495

Leu Leu Phe Asn Thr Thr Arg Asp Thr Leu Ser Pro Ala Asp Pro
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Arg Ile Val Glu Thr Ser Ser Leu Thr Asp Phe Gly Thr Ser Gln Lys
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Thr Lys Cys Asp Phe Trp His Gly Ser Ile Ser Val Asn Ala Gly Leu
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<210> 5
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<212> PRT
<213> Rhodosporidium toruloides

<400> 5

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<210> 6

<211> 24

<212> DNA

<213> Other nucleic acid

<400> 6

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<210> 7

<211> 30

<212> DNA

<213> Other nucleic acid

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<210> 8

<211> 30

<212> DNA

<213> Other nucleic acid

<400> 8

gaaagacccc tagagacccg cgttcaccga

30

<210> 9

<211> 6

<212> PRT

<213> Rhodosporidium toruloides

<400> 9

Thr Asn Pro Asn Glu Pro

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<210> 10

<211> 17

<212> PRT

<213> Other nucleic acid

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Cys

<210> 11

<211> 17

<212> PRT

<213> Other nucleic acid

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Thr

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<211> 17

<212> PRT

<213> Other Nucleic Acid

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Thr

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<211> 17

<212> PRT

<213> Other nucleic acid

<400> 13

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Thr

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<211> 17

<212> PRT

<213> Other nucleic acid

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1 5 10 15

Thr

<210> 15

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<213> Other nucleic acid

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Gly Gly Tyr Thr Cys Arg Thr Thr Cys Gly Gly Arg Thr Thr Asn Gly
1 5 10 15

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